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THE EXCAVATING ENGINEER PUBLISHING COMPANY

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150-B Bucyrus Shovel, Pittsburg Scammon Coal Co., Pittsburg, Kansas.

Recent Developments in Open Cut Coal Mining in Kansas

By W. S. Russell

IN southeastern Kansas, with Pittsburg as the business center, is an extensive field of good bituminous coal. The nature of the deposits is such as to preclude mining a large percentage economically by the drift method as carried on where the coal has an overburden of rock.

These deposits outcrop and the strata dip gently to the west and north. In the neighborhood of these outcroppings the open cut method of mining has been carried on for many years. The work, until recently, has been done by ordinary scrapers.

Now, however, more modern methods are being used with great advantage from an economical standpoint. The dragline and the steam shovel are doing wonderful work in stripping the overburden. The limitation of the work of these machines, with coal at the present price, is probably 40 feet of overburden. There is a vast quantity of coal carrying a greater overburden than 40 feet, which cannot be handled well under cover. This supply will probably remain untouched until the price of coal advances to a point that will warrant the extra stripping expense necessary.

It is expected that with the introduction of steam shovels there will be radical changes made in the method of taking the coal out of the pit, transportation to tipple and loading on railroad cars.

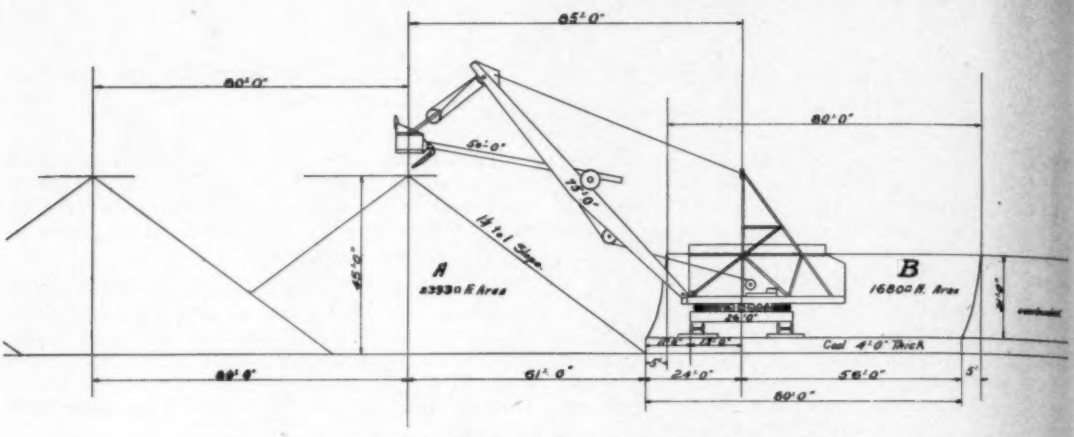
The customary method for many years has been to run two or three light tracks into the pit up to the breast of the coal and load the tram cars by hand. Three men to a car are used as shown in one of our illustrations.

The cars are hauled to the end of the pit by mules or horses, then by means of a steam or gasoline driven winch, they are pulled up the slope. The trip to the tipple is completed by horse or mule power. This is shown in the view of the Pratt-Durkee cableway and tipple which we give here.

New methods however, are now being developed and are to be tried out this year. The C. H. Markham Coal Co,. are using a small geared locomotive. This machine hauls 15 two-ton tram cars from the pit to the tipple, a distance of over half a mile, in a few minutes. The locomotive hauls 4 cars out of the pit, on a 9 per cent grade, and assembles a train of 12 cars in six or seven minutes. The train is then hauled to the tipple and arrives at about the time that the preceding train has completed unloading. This arrangement shows a great saving of time over older methods.

Another method is to place a revolving crane on the coal, having the train on the original ground level near the edge of the bank, lift the empty tram cars from the bank and lower them to the pit. The

Loading Coal by Hand Behind a Vulcan No. 5 Shovel. Pratt-Durkee Coal Co., Pittsburg, Kansas.

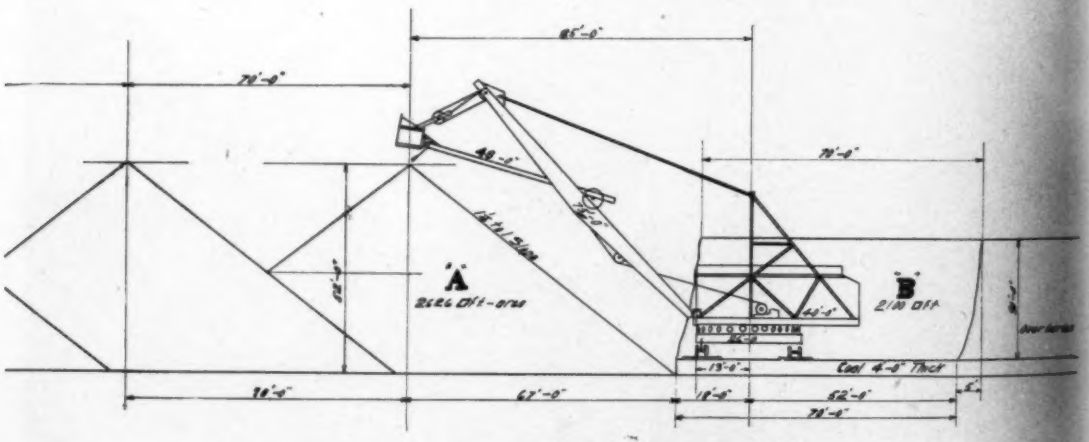


Bucyrus 175-B Shovel Stripping 21 Feet of Overburden with an 80 Foot Pit.

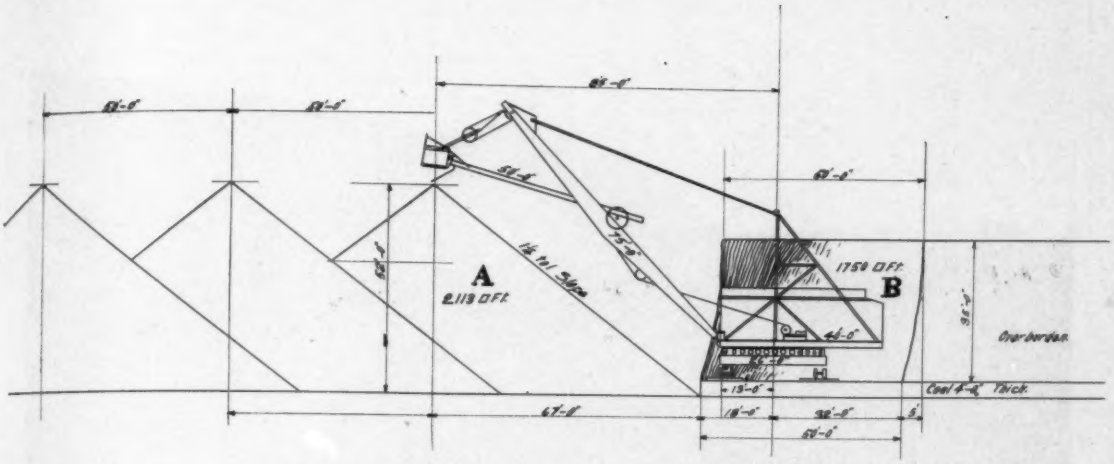
loaded cars are likewise raised to the track above. This work is done at the rate of 25 cars an hour or 400 tons of coal per day of 9 hours.

The advantage of this method lies in the fact that the delays caused by encountering "horse-backs" in the coal are very much lessened.

In explanation of the term "horse-back" we may say it is a mass of fire clay, usually from 3 to 4 feet thick and of the same depth or thickness of the coal. It extends across a coal vein and forms a barrier to the progress of the work as done by old methods. When the tram tracks are in the bottom of the pit it becomes necessary to dig through these masses of fire clay in order to permit the tram cars to pass. With the revolving crane method, however, this becomes unnecessary. The crane is simply moved up a few feet so that the men loading the cars can break into the coal on the other side of the "horse-back" and the latter is left intact. Another advantage of this method of handling is that there is less expense than where the cars must be hauled up an incline and the single track on top of the bank can be maintained at a much less expense than can several tracks in the pit. Tracks laid in the pit are always more or less covered with mud and must be frequently shifted.



Bucyrus 175-B Shovel Stripping 30 Feet Deep and 70 Feet Wide.



Bucyrus 175-B Stripping 35 Feet Deep and 50 Feet Wide.

150-B Bucyrus Shovel, Markham Coal Co., Pittsburg, Kans., Showing the Machine Starting a Box Cut.

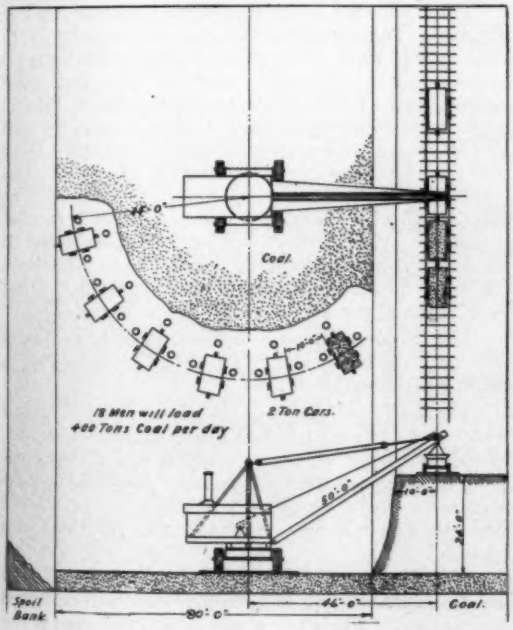
The Old Method of Loading Coal. Three Men to a Car. Cars Hauled by Mules to the End of the Pit.

New Way of Loading Coal. Note the Three Tracks Behind the Shovel.

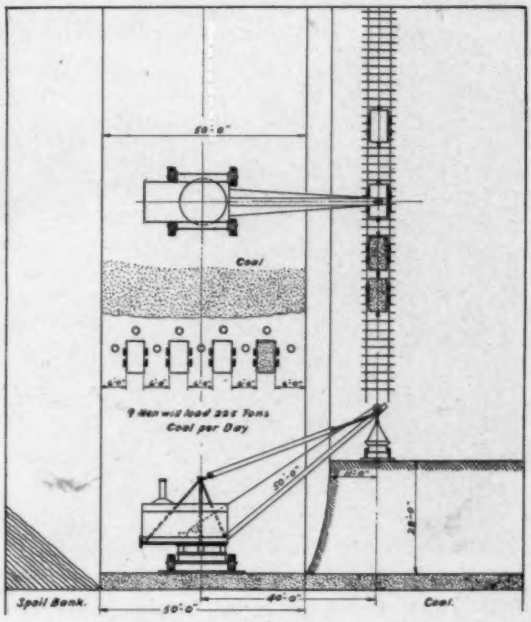
The more modern method involves the use of a small revolving shovel to load the coal and two firms, the Besse-Cockerill Coal Co., and the J. J. Stephenson Coal Co., are now using this method with entire satisfaction. One of our illustrations is a view in one of the mines of the former company near Wier City.

The Marion shovel used by the Besse-Cockerill Co, weighs 18 tons, has a ¾ yard dipper and is operated by four men, two on the shovel and two in the pit. This machine can load about 160 tons of coal per day, thus doing the work of 8 men shoveling by hand. A still greater advantage could be gained by using a larger machine on this work as it could load twice as much coal with but a small additional expense. But the small machine was installed as an experiment and has demonstrated its practicability under conditions where "horse-backs" are not too frequent.

It is evident that a larger revolving shovel can be used to very great advantage in a pit where from 60 to 80 ft., in width of coal is uncovered. A shovel may load one-half the width of coal thus uncovered, for two or three hundred feet or more in length, into tram cars placed on top of the coal and then, by shifting the track to the bottom of the pit, take out the other half.



Loading Coal with a Locomotive Crane in a 80 Foot Cut.



Loading Coal with a Locomotive Crane in a 50 Foot Cut.

The advantage is in having a string of 10 or 12 cars to load, one after the other without delay, and also in having but a single track to handle.

When "horse-backs" are encountered they are readily dug out by this larger machine, which has a greater reach, and deposited in a convenient place behind it at one side of the pit.

This method greatly reduces the expense over hand labor and will no doubt grow in popularity and be generally adopted.

Our illustrations show different depths and widths of stripping which have been handled by the Bucyrus 175 B revolving shovel. This steam shovel has a boom 75 ft., in length, a 3½ cubic yard dipper and weighs about 190 tons. It will handle 2500 yards of ordinary material per day of nine hours. The illustrations show 35 ft., in depth of stripping with 50 feet of coal uncovered; 30 ft., in depth of stripping with 70 ft., of coal uncovered and 21 ft., in depth of stripping with 80 ft., of coal uncovered.

In opening up a new coal field and in making a box pit this machine will handle 20 feet in depth of stripping in a cut 60 ft. wide, with 50 feet of coal uncovered, depositing the spoil all on one side.

Three of these shovels are now in operation near Pittsburg, Kansas, owned by Smith, Scott and White, stripping contractors.

Top of Incline, Pratt-Durkee Coal Co. Showing Cableway, Engine House and Tipple in the Distance.

Side Track Construction by Dragline Excavator.

The subject of our front cover illustration is J. R. Swigart's Bucyrus class 14 dragline excavator making a passing track for the C. M. & St. P. Ry. at Turkey River, Iowa. Just to the right of the dragline running parallel to the track is the Mississippi river. The dragline, in fact, is working in the river bottoms.

The side or passing track is 4000 feet long, the crown of the fill is 25 feet varying in height from 10 to 22 feet. The fill was all made in one cut. The excavation amounted to 40,000 cubic yards consisting of mud, sand and gravel. The digging was made extremely hard by the severe weather, in fact the machine had to dig through a foot of frost. Indeed, in order to get a hold with the bucket to move ahead, it was necessary to shoot holes in the frozen ground.

During the last ten days the work was further complicated by the fact that in order to borrow sufficient material for the 22 foot fill, the machine had to dig below river level. Freezing weather made this a very difficult job, but the dragline handled this successfully.

Mr. Swigart states that this job could never have been done at this time of year by any other machine. If it had been done by hand labor with wheel-barrows it would have been impossible to have finished until the spring. The dragline completed the job in spite of many difficulties in one month and ten days.

J. R. Swigart has just started another small rock job for the C. M. & St. P. Ry. at Cameron Siding 28 miles north of Dubuque, Iowa. The contract is all hand work and it is expected it will be completed in about a month.

Two Bucyrus 15 Yard Dredges for Panama

The Isthmian Canal Commission has recently awarded the contract for building two of the largest dipper dredges in the world to the Bucyrus Company.

They will be designed for the hardest kind of digging. Their dippers will have a capacity of 15 cubic yards level full and be capable of picking up approximately 20 cubic yards of material when heaped up. Their main engines will be tandem cross compound condensing with cylinders 16 inch and 28 inch bore by 24 inch stroke, and will exert a pull on the dipper of approximately 120 tons. This pull will be made by one single plow steel rope (single whip) of the largest size made i. e. 3¼ inches diameter. The dredges will carry booms about 62 feet long and will be arranged to dig to a depth of 50 feet. The spuds will be 4 feet square by 75 feet long, and of steel construction

The Scotch Marine boilers on each dredge will provide the power. They will be equipped to burn either coal or oil.

The hulls will be steel 144 feet long by 44 feet wide and having a mean draft of about 14 feet. Wooden houses will be provided containing complete quarters for the crews, and all modern improvements for life in tropical climates will be installed. The dredges will be electric lighted by their own plants.

The Hudson River will be the scene of their erection and testing, after which they will be towed to Panama. Their work will lie in the Canal prism and in Gatun Lake.

Mining Salt with Steam Shovel in California

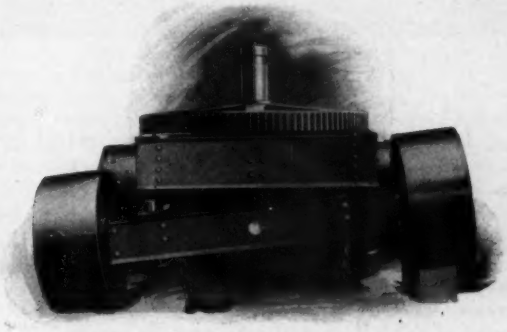
TWO hundred and seventy-five miles east of Los Angeles, in the middle of the Colorado desert, where the temperature for six months in the year ranges between 90 and 130 degrees in the shade, the Consumers Salt Company are operating extensive rock salt deposits. According to Mr. W. K. Reese, Jr., the Vice-President and General Manager, the highest temperature was taken on a cool day, as no one as yet has been brave enough to hang out the thermometer when it was hot.

The property is located on the main line of the Santa Fe at Saltus, California.

The conditions are very unusual. The water for drinking purposes and for use on the steam shovel is hauled a distance of about 90 miles in tank cars and costs them $30.00 per car of 10,000 gallons. The laborers employed are Mexicans and Hindoos.

The salt lies in a blanket formation ranging in thickness from five to eight feet and is covered with an overburden of silt and mud with a depth of from three to five feet. The overburden is stripped by a 14-B Bucyrus revolving shovel equipped with a ⅝ yard dipper. An idea of this process may be gained from the accompanying illustrations. The

Bucyrus Revolving Shovel Ready to Move Forward. Note Angle of the Carbody in Reference to the Truck, Showing Action of Pivoted Axle.

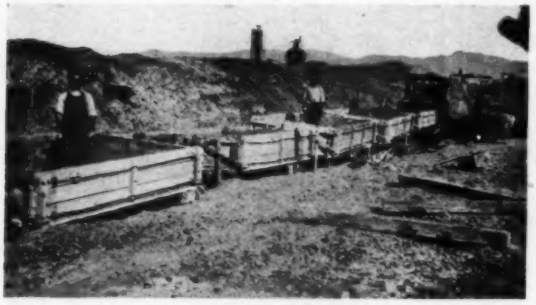


Truck of 14-B Bucyrus Revolving Shovel showing Pivoted Axel.

5 Feet of Solid Rock Salt

Starting to Drill for Blasting

Loading Pit



Loading 4-yard Dump Cars.

shovel burns oil at the rate of about 2½ barrels per day of nine hours, the oil costing about $1.50 per barrel. The water consumption per day is approximately 500 gallons.

The machine has been found to be admirably adapted to this class of service. Its unusually long reach renders it particularly efficient in casting over the overburden while its wide working radius makes it possible to clean up a wide cut. Furthermore, it has been found very easy to handle.

An interesting feature of its construction as adapted to this class of work is shown clearly on the photograph illustrating the machine in the act of being moved. We have reference to the pivoted axle which enables the shovel to work on rough or uneven ground without strain or inconvenience. The view of the truck shows this feature in detail, but it will be noted by examining the photograph closely how this feature of construction operates under working conditions.

The machine has hardly been in service long enough to enable the company to obtain any figures upon the saving effected over the previous method of operation, which was with hand labor, mules and scrapers.

General View of Mine. Gasoline Tank and Compressor in Background. Cars Loaded with Salt.

It can be seen already, however, that the labor situation has been greatly improved and the labor cost much reduced, as the extremely high temperature prevailing has not only made it very difficult to keep laborers, but has materially decreased their efficiency.

After the overburden has been removed by the shovel the salt is blasted and loaded into Continental 4-yard two-way side dump cars and hauled 4 miles by a 50 H. P. Milwaukee gasoline locomotive to their mill, which has a capacity of 15 tons per hour. Here it is crushed by a Jeffrey crusher, elevated into bins where it is fed into a washer composed of spiral conveyors and then to a revolving dryer 30 feet long by 4½ feet in diameter. From there it is conveyed to Davis crushing rolls then elevated to the top of the storage bins where it is sized into four sizes or grades by Jeffrey vibrating screens. The grades are designated as hides, ice cream, sheep, fish and land or hay salts and are shipped in 50 and 150 pound sacks. The market for their product is Southern California and Arizona.

The Company at present, is under very capable management, W. K. Reese, Sr. is President, W. K. Reese, Jr. is Vice-President and General Manager, W. P. Musaus, Secretary, and I. W. Ball and W. P. Soran, Directors.

The World's Placer Dredge Record

According to the figures of Mr. Charles Janin the world's record for placer dredges was made during this last year by Natoma No. 4, a 13 foot Bucyrus dredge owned by the Natomas Consolidated of California. This dredge excavated 4,056,400 cubic yards from an average depth of 19 feet at a cost of 2.4 cents per yard.

An American ship lay in an English port and the sailors were entertaining a few English seamen.

Shortly a spirit of rivalry arose. The sailors tried to outdo one another in athletic tricks.

An Englishman climbed to the very top of the mainmast and there stood on his head.

"By jingo, no Englishman beats me"! one of the American sailors shouted.

He scampered up the ropes monkey-like and, reaching the top, prepared to duplicate the Englishman's feat. He put his head down and gave a push with his feet, and fell heels over head.

His back struck the first rope, his legs the next, his neck the next and so on, somersault after somersault, finally landing with rare good fortune squarely on his feet on the deck.

"Do that, you son-of-a-gun!" he shouted, when he got his breath. "Do that!" —*Yarns.*

Neponset River Improvements in Massachusetts

* By E. M. Blake

THE Massachusetts State Board of Health received proposals for dredging the Neponset River in the City of Boston and the towns of Milton, Dedham, Westwood, Norwood, Canton and Sharon, on August 26, 1912, based upon the plans and specifications which the Board hoped at that time could be carried out. Three bids were received, the total amount of each being as follows:

Eastern Dredging Company, Boston	$236,900
Michael J. Meehan, Boston	237,000
Barge Canal Construction Co., New York	158,900

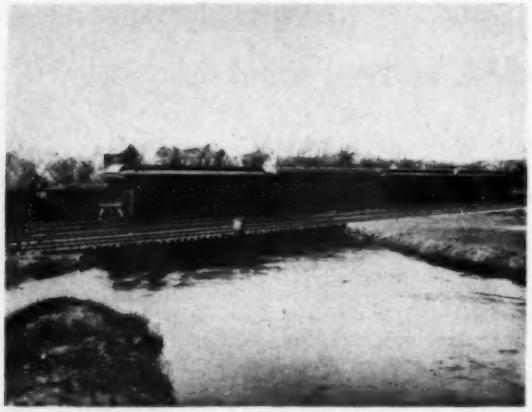
The above total amounts are based upon the quantities stated in the advertisement as the basis upon which the bids would be compared. Unit prices varied from 42c to 63c per cubic yard for soft material; from 50c to 75c per cubic yard for hard material; from $6.00 to $15.00 per cubic yard for boulders larger than 9 cubic feet in volume and from $7.50 to $15.00 per cubic yard for ledge rock. These figures show an unusually wide variation in the bidding prices for this class of work.

It was evident at once that it would be impossible to let a contract under any one of these bids inasmuch as the total appropriation of $150,000 covered not only the work called for in the advertisement but also the work of alteration and repair to bridges and pipe crossings, the engineering charges and all extras, such as overhaul, excess material for filling in cut-offs and the yardage contained in six inches outside of the designated cross sections of the proposed channel. The Board, therefore, rejected all bids and new studies were made forthwith to determine in what particulars the high cost as shown in these bids could be reduced, without material difference in the results to be accomplished.

In preparation for the bids received on August 26th, eleven different complete plans of improve-

*Engineer in Charge.

The Neponset Meadows Below Blue Hill, March 18, 1912. The Flood Conditions Shown Here are to be Eliminated by the New Channel.



The 8-train yard tracks below Readville carried over on 300 piles driven in to the Neponset River. This bridge will probably be rebuilt and piles removed permanently as they cause a serious loss of head in stages of high flow.

ment were studied in detail and full estimates of quantities were made for each plan. In preparation for the second call for bids, five additional plans were studied with the same detail and the specifications were carefully revised to cover the plan finally adopted as the basis for the second call for bids. The principal changes made were as follows:

1. The time for completing the contract was extended to November 15, 1914, giving the contractor one additional season in which to do the work.

2. The upper division of the previous plan in which the river ran in a narrow channel through a thickly wooded area was cut out, thereby reducing the total length of river to be improved by 5119 feet.

3. The specification for the disposal of dredged material was changed so that the contractor could place it to a depth of four feet instead of one foot, should he so desire, over an area running back 200 feet from either bank of the river.

4. The designated cross sections, to which the new channel of the river was to be excavated, were radically changed.

5. The pile bridge in the Hyde Park section which carries eight train yard tracks across the river on about 300 piles was taken out of the work covered by the specifications, provision for any dredging or alteration at this bridge being made under the head of "Extra Work" or supplemental contract.

The second letting was then advertised and six (6) bids were received on October 3, the totals of each being as follows:

William L. Miller, of Boston	$143,000
Bay Dredging & Contr. Co., of Brooklyn	122,900
John H. Cavanagh, of Boston	122,100
Barge Canal Constr. Co., of New York	113,900
U. S. Drainage & Irrigation Co., of New York	181,600
Eastern Dredging Co., of Boston	134,300

The unit prices varied from 32c to 58c per cubic yard for soft material; from 42c to 72c per cubic yard for hard material; from $7.50 to $14.00 per cubic yard for boulders over 9 feet in volume, and from $7.50 to $14.00 per cubic yard for ledge rock.

The quantities upon which the bids were compared were as follows:

Soft material	130,000	cubic yards
Hard material	130,000	cubic yards
Boulders	100	cubic yards
Ledge rock	800	cubic yards

For canvas of the above bids, see our November issue on page 57.

Action on these bids was deferred until October 10, upon which date the Board awarded the contract to the Barge Canal Construction Company, 130 Nassau Street, New York City, whose bid was as follows:

Soft material	$0.42	per cubic yard
Hard material	.42	per cubic yard
Boulders	7.50	per cubic yard
Ledge rock	7.50	per cubic yard

The large saving in engineering charges, as well as a probable saving in litigation and disputes, as a result of exactly the same price for both hard and soft material, was evident to the Board.

The work is now under way. One dipper dredge has been installed just below Pauls Bridge, which is about two miles above the Mattapan Paper Mills Dam, the lower terminus of the present work. In this section, most of the hardest material and all of the ledge rock will be encountered, and there are 3 railroad bridges, 2 highway bridges and 2 foot bridges in addition to the pile bridge above referred to; two 10-inch water pipes, one 12-inch water pipe, two 16-inch cast iron sewers and one 4-inch condenser suction pipe from the power house of the Edison Electric Illuminating Company. Any work on pipes and sewers, on the pile bridge and on foundations to all other bridges is to be done by the Board and is not included in the contract; but the contractor must remove material from under all of the bridges, except the pile bridge, if so required by the Board.

Another dipper dredge or a 10-inch hydraulic suction dredge is to be installed at the upper end of the work near Neponset Street in the town of Norwood, working downstream towards Pauls Bridge. Here two highway bridges, one railroad bridge and one trolley trestle bridge are encountered, from under which the contractor must remove material, if so required by the Board. The greater part of the material here is soft and ideal for suction dredging, which would also make its disposal easier

and more satisfactory, especially in the filling in of cut-off channels.

Releases for the deposit of dredged material are rapidly being secured from the property owners along the ten miles of river to be improved, with only slight, if any, objection, so anxious are all concerned to see the work speedily carried out. It has been a season of very low flow from the watershed and the conditions have been very offensive and objectionable, aggravated by a break in the sedimentation basin of a large tannery in the Town of Norwood which let over 6,000,000 gallons of raw tannery wastes down into the river. Public sentiment appears to be earnestly in favor of carrying out the present contract as speedily as possible, with a moral assurance of additional appropriations, if needed, to complete and extend the work until the entire river is improved and the unsanitary and offensive conditions removed forever.

The hydraulic calculations were based upon a final channel with a discharging capacity at the rate of 4 second feet per square mile of watershed, and so designed that there would be the greatest depth and velocity possible during the low flow period, with a water surface during periods of high-flow below the general level of the meadow areas to prevent flooding and subsequent areas of stagnant water.

Morning and afternoon daily gage readings have been taken at six important points on the river since the fall of 1911. Current meter stations have been established and gagings made at frequent intervals since January, 1912. This and much other valuable hydraulic data is being accumulated and studied. While the work of deepening and enlarging the channel is going on the Board, under legislative authority, is gradually compelling all of the mills and factories on the river to install modern and adequate filtration systems for the treatment of their wastes so that when the improvement of the channel is completed, the new Neponset River will not only care for high flows without flooding the valuable meadow lands, but will also carry down through the various towns and the City of Boston, water free from the offensiveness which characterizes largely the entire length of the river today, with the resultant elimination of unsanitary and unhealthful conditions.

The contractor's plant at present consists of a large coal scow and one Fairbank's dipper dredge of 1¼ yards capacity. Coal is stored at points accessible to the river where it is loaded into the scow and towed up or down stream to the dredge. The scow has a capacity of about 15 tons.

The dredge has averaged about 315 cubic yards per day of two 8 hour shifts. A high output was impossible, however, because of the fact that much

Foot bridge of reinforced concrete crossing the Neponset River at B Street in Hyde Park. The upper ledge section starts just above this bridge. This shows one of the many bridge difficulties encountered through Hyde Park.

of the work covered by this first estimate was on a stretch of the river where a large part of the bank was lined with trees on land of the Metropolitan Park Commission, the preservation of as many as possible being imperative; and, furthermore, that the material in this section was over 50% cemented gravel, boulders and hardpan with some blue clay, the hardest material to be encountered in the entire work.

The contractor is paid for six inches outside of and below the grades and side slopes given him by the engineer if he removes it, but he must get at least to the grades and lines given. The few final soundings so far made indicate that he will probably average from 6 inches to 10 inches below grade, which is close work for dredging in a flowing river and allows for some deposit of suspended material resulting from the operation of dredging. Boulders less than 9 cubic feet in volume are included in earth excavation. One boulder has been removed by the dipper, containing 2 cubic yards, and a number ranging from 14 to 20 cubic feet.

In the original soundings and estimates, earth was classified as "hard" and "soft" material. The contractor's bid was the same for each, which will result in a great saving in engineering work in the field, and will prevent disputes which almost invariably arise in this class of work where opinions are likely to differ on the line of demarcation between hard and soft material.

The contractor is to install in the immediate future a second dredge, of the floating derrick and orange-peel bucket type, to handle the excavation through the settled district in Hyde Park where a large number of bridges and pipe lines will interfere

with the work. It is also his plan at present to install a third dredge, of the dipper or hydraulic suction type, at the upper end of the meadows, in the spring, to work down stream toward the present dipper dredge.

The work is all under the direction of Mr. X. H. Goodnough, Chief Engineer of the Massachusetts State Board of Health, with the writer as Engineer in Charge. The field assistants are Mr. Newton L. Hammond, Mr. E. F. Davis, Mr. H. S. Wright and Mr. W. G. Norteman.

The Barge Canal Construction Company is comprised of Messrs. Charles Longenecker, Louis B. Harrison and George W. Beeman.

The Largest Re-Inforced Concrete Arch Bridge in America

The John F. Casey Co., of Pittsburgh, Pennsylvania recently completed the construction of the Larimer Avenue bridge, which is the largest reinforced concrete arch bridge in America. This bridge replaces a combination wood and iron viaduct which spanned Washington Avenue in Pittsburgh. The old bridge was built in 1891 and 1892 and had 60 feet spans on wooden towers. The new bridge has a clear span of 300 feet 4⅞ inches, a main span of 312 feet and a length over all of 670 feet. It is 50 feet in width, two side-walks, each 10 feet wide, and is 110 feet above the ground.

The falsework for the main arch ribs, was designed by Mr. Ottomar Stange, General Superintendent for the contractor and consisted of 241,815 bd. ft. of long leaf yellow pine.

Plans for the number, spacing and location of the steel reinforcement bars throughout the work were submitted by Mr. O. Stange, and approved by the City Engineers. The reinforcement consisted of Mueser diamond bars and large heavy steel angles.

Crushed limestone was used in the concrete for all parts of the bridge above the ground level and gravel in those sections below the ground. Universal Portland Cement and Allegheny River Sand were used throughout the whole bridge.

The Larimer Avenue arch is noteworthy for the very successful surface finish obtained upon it. The main surfaces everywhere were bushhammered, giving the surface an excellent texture and very uniform color tone.

The principal feature of the plant installation was a Lidgerwood cableway, with towers 60 ft. high and a span of 750 ft. The towers were placed on tracks and equipped with a 12x12 Lidgerwood aerial dump cableway engine, and an 8¼x10 compound gear special tower moving engine.

The bridge was designed and its construction was supervised by the Bureau of Construction of the Department of Public Works of Pittsburgh, (J. G. Armstrong, Director) of the Department, N. S. Sprague, Superintendent of the Bureau) Willis Whited was Division Engineer during the design, T. J. Wilkerson as designing engineer, later succeeding Mr. Whited and was in charge during construction. The contract was awarded to the John F. Casey Company of Pittsburgh, Mr. Ottomar Stange, General Superintendent.

Larimer Avenue Bridge, Pittsburg, Pa. John F. Casey Co., Contractors.

The Excavating Engineer
[FORMERLY STEAM SHOVEL NEWS]

A Monthly Publication Devoted to Excavating *and* Allied Subjects

Contributions bearing upon the practical aspects of the above work are solicited, and if accepted will be paid for at the usual rates.

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Notice to discontinue should be written to the Milwaukee Office in every instance.

Advertising copy should reach Milwaukee Office by 10th of month, before date of issue.

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Bradlee Van Brunt, Manager *and* Editor
267 National Avenue Milwaukee, Wis., U. S. A.

When The Excavating Engineer succeeded The Steam Shovel News the policy was inaugurated to make the paper the best journal in its field, both in form and matter. The expense of doing this has been considerable, and the publishers now feel the necessity of reducing it. The paper has been so enthusiastically received that it does not seem desirable to make any change in the paper itself. It is, therefore, necessary to reduce the number of copies printed. In the future all paid subscribers will receive the paper regularly. It is not, however, possible for those on our complimentary mailing list to receive every issue of the paper. We wish to send them as many issues as possible and will endeavor to arrange our list so that those who are not paid subscribers will receive nine copies per year.

Developments of the Month

The last six weeks has seen a steady conservative improvement in the construction outlook. The last two weeks of February were quiet as far as actual awards were concerned, but there was a strong and persistent undertone promising more work in the very near future. Recent developments have borne this out, for, ever since the first of March things have been picking up rapidly.

This slow improvement, however, has given concern to some contractors who have attributed the sluggishness of early spring conditions to the fact that the railroads have had difficulty in disposing of their securities for financing new construction. The causes at the bottom of this, of course, have been laid at the door of undue agitation, but though this probably is true in a general way, the direct causes can probably be found in the uncertainty due to a change in administration, and to the threatened strike of the firemen on 54 eastern roads. However, the improvement during the last few weeks has been sufficient to make such speculations of minor importance to the contractor for the time being.

The largest railroad contract let recently is the C. B. & Q's Powder River-Arin Junction line, consisting of 140 miles of work aggregating about $7,000,000. Twohy Bros., are the general contractors. The same road is also starting the double tracking of their Mississippi River Division on its Chicago-St. Paul line.

The Northern Pacific Railway has awarded a contract for 100 miles of new line from Stanton, North Dakota, to the south end of the Kildeer Mountains to A. Guthrie & Co., and are about to let $4,000,000.00 worth of reconstruction work between Seattle and Sumas, Washington.

The Lake Erie & Youngstown Railroad have given the Caldwell Cons. Co., a big contract between Youngstown and Conneaut, Ohio, involving 1,400,000 cubic yards of earth and 300,000 cubic yards of rock excavation besides five bridges.

The Soo has awarded to Foley Bros., Welch and Stewart, of St. Paul, Minnesota, the contract for 81 miles for their Flaxton extension and the Plaza extension of 34 miles.

As we go to press, press reports from Winnipeg state that two Spokane firms have been awarded the contracts to complete the Kootenay Central branch of the C. P. R., costing $3,300,000.00

The Design of the Tompkins Cove Plant

In our December number we published an article describing the Tompkins Cove Stone Company's plant at Tompkins Cove, New York, in which we made the statement that the general design of this plant was made by the Edison Crushing Roll Company of Stewartsville, New Jersey. Mr. P. K. Yates, the former superintendent and engineer of construction of the Tompkins Cove Stone Company writes us that our statement in regard to the credit for the design of the plant, was not substantially correct. He states that although his ideas were based upon the plans of the Edison Crushing Roll Company, he worked out the general design independently except for the rolls themselves and those details in which he had the assistance of the Stephens-Adamson Company, Allis-Chalmers Company and others.

North Dakota Leads in Railroad Construction.

It is interesting to note from year to year, how the states stand in the race for the highest railroad mileage constructed during the preceding year, as this indicates very accurately where the country is developing the fastest.

An examination of the annual statistics of main track completed during the past year indicates that North Dakota has overhauled Texas, which state has lead for the last three years. The order in which the states finished, to use a sporting phrase, was as follows: (we do not include those states in which under 100 miles were built).

1.	North Dakota	347 miles
2.	Texas	336 miles
3.	Oklahoma	242 miles
4.	Florida	182 miles
5.	Georgia	153 miles
6.	Montana	130 miles
7.	Kentucky	119 miles
8.	Washington	105 miles
	Arizona	105 miles
	Idaho	105 miles

In 1911 Texas led with 414 miles and Oregon was second with 224 miles completed. North Dakota's mileage was due principally to the Great Northern and the Minneapolis, St. Paul and Sault Ste Marie railways. The former building 202 and the latter 131 miles of new line.

Prevention of Missed Fires in Quarry Blasting.

We owe to the Contractor the substance of a paper dealing with the prevention of missed fires in quarry blasting, which was read by Mr. W. H. Mason of Stewartsville, N. J. before The American Society of Mechanical Engineers at its annual meeting on December 5th.

Missed holes are always a source of danger, and up to the present time, according to Mr. Mason, no safe way of unloading them, has been discovered. The ordinary method of handling them is to drill a second hole adjacent to the missed one and subsequently shoot them both, the missed hole being exploded by the detonation of the new one. This operation has two distinct disadvantages: first, there is liability of the drill reaching the dynamite in the loaded hole, thereby causing an explosion; secondly, the second shot may throw the explosive from the missed hole out among the debris without exploding it. This is said to occur frequently and unless extreme precautions are used in loading the debris, a chance blow on the dynamite may cause an explosion. It is therefore highly advisable to prevent missed fires entirely, if possible.

As a means of accomplishing this the Edison Portland Cement Company for the past eight years has been exploding all churn drill blast holes with a 500-volt direct-current power circuit. Many of these blasts have included from 12 to 20 holes, each loaded with 500 to 800 lbs. of 40 and 50 per cent gelatine powder, and during this time there has been only one missed hole. On this occasion, it was impossible to find the cause of failure, but it was attributed to a poor connection between the exploder leads and the bus wires. Previously this company had been using the common push-down batteries, and it was a usual thing to have several missed holes per month. At one of the company's quarries located where no power circuit is available, a 250-volt direct-current generator, driven by a steam turbine, has been installed for setting off blasts and has given entire satisfaction.

In discussing the use of gelatine powder, Mr. Mason called attention to the fact that it is the most difficult of all the dynamites to detonate, and also that if exploded by a powerful detonator the full effect of the powder is obtained, while if improperly detonated much of the effect is lost. For this reason, and also on account of the danger and expense which always accompany a missed hole, it is well, in his opinion, to use an ample supply of high power exploders. In a 6-inch hole, running 60 feet deep, not less than three exploders should be used. One of these should be directly at the bottom, so that if when loading the hole with dynamite, a stone should slide in from the side and block it off, it would still be possible to explode the dynamite below. The other two are placed one near the center and the other near the top. All are connected directly across the 500-volt or 250-volt direct-current line, so that all exploders are in parallel, and receive the full voltage of the power circuit. By this method any number of holes may be exploded at one time.

The cost of the extra exploders is always a small proportion of the cost of the dynamite used, and, in Mr. Mason's opinion, this expense is warranted by the increased detonating power of the exploder, as well as by insurance against missed fires, which are always expensive even aside from their potential danger. Their use has also resulted in greater general efficiency on the part of the workman.

The Railway Supply Company Incorporates.

The firm of Smith & Wiggin of Mexico City have recently incorporated their business into a stock company known as The Railway Supply Company, S. A. Mr. Carl Holt Smith is President and Treasurer and Mr. Ralph M. Wiggin is Vice-President and Secretary. The company will continue to represent the Bucyrus Company and the Baldwin Locomotive Company in the Republic of Mexico. It is their intention to establish agencies in two or more other cities in the Republic. They are located at Cinco de Mayo 6-B Apartado (P. O. Box) 47 B.

Field Notes

Cautions for Shovel Runners

By Griff Hughes

When moving a shovel back it is important to keep the dipper as close as possible to the bottom of the cut without interfering with the track. Don't have the dipper hanging with steam on the crowding engines. While the machine is standing waiting for a track to be laid the steam naturally gets down in the boiler and the fire will be bad. When you start to move, therefore, a great portion of the power will be taken from the crowding engines and the dipper will drop, endangering those who are in front of the shovel tearing up the track.

Another important thing to remember is not to neglect to chain the circle, in order to keep the boom from swinging. For when the shovel is being moved, the back end may get off the track, the shovel may settle on one side or a rail may break, which would be apt to cause the shovel to start to tip over. Nine times out of ten there would be water in the swinging engines as the shovel has probably been standing by while the track was being laid. Hence there would be no power to swing the boom back and balance the machine. As a matter of fact, even though there was live steam, it would be very difficult to keep from losing control when the boom has swung far over to the side.

To prevent absolutely such an accident as this, it only takes a few minutes to fasten one end of the chain over the A-frame and the other end to the turn buckle clevis on the circle. By so doing you will not only save yourself from the possibility of accident but you will probably save the firm for whom you are working much money and valuable time.

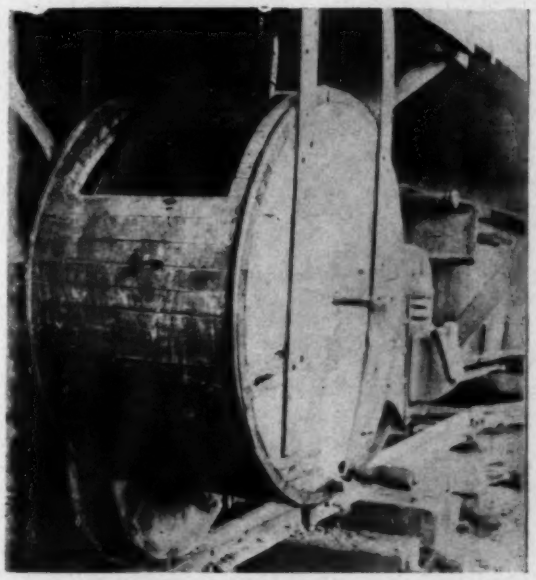
A Washing Machine on a Steam Shovel

We give an illustration of a washing machine which has been devised by Mr. Chas. Supernaw of Elgin, Ill. and used by him for a considerable period of time with a great deal of satisfaction. He states the machine is made from cypress as he has found this will stand the water better than any other kind of wood.

The inside cylinder is 24″ in diameter, the staves being 12″ long 2″ wide and 7/8″ thick. A small space is left between each one of the staves and they are also perforated with 1/2″ holes which permits free access of the water while the cylinder is in motion. A reinforcing hoop of band iron 1/8″ thick and 1″ wide is put around the ends of the staves. The door to the inner cylinder should be made flush so that it will not come in contact with the outer barrel and the hinges should be put on with rivets rather than with screws. It is held closed by a hasp and staple.

Inside of the inner cylinder are 8 slats projecting 1 1/2″ inwardly and 7/8″ thick. These slats are very essential as they carry the clothes up to a high point and they are then dropped back into the suds. It is this action which adds greatly to the efficiency of the washer.

The outside drum is 28″ in diameter and 16″ long. The staves of this cylinder are made 1 3/4″ wide and 7/8″ thick, and are carefully fitted so they are water tight. As shown, an outer door is provided near the top of this cylinder. A piece of pipe having a number of perforations in it, pointing toward the center of the machine, is inserted at the lower side of the outer drum and this is connected



Showing Inner Drum Open.

to the boiler. The necessary steam is furnished by this connection. Another hole at the lowest point of the outer drum is made for draining the washer. The shaft upon which the inner drum turns is made by screwing a piece of pipe about 3/4″ in diameter into flat plates made from 3/8″ metal and about 5/8″ square. These plates are then centered on the heads of the inner drum and screwed to it, the connecting pipe projecting through suitable holes in the head of the outer drum and one end of the shaft is attached to a suitable crank for turning the machine. In operating the machine it should be turned slowly as it has been found to give better results than when turned fast.

Roberts' Patent Steam Track-Layer

"It puts down two-thirds of the entire trackage of the country"! So say Roberts Brothers the manufacturers, and there are few doubtless who would dispute the claim. Its simple construction, its practicability and its long successful use are facts long known by railroad men. Like the Goodwin Car they are never sold outright, but leased on a royalty basis per mile of track laid.

This machine possesses a number of unique features which we here describe.

The machine comprises two sectional tramways and shafts, a small stationary engine with its connecting steam-pipe and simple forward rigging.

The two tramways, one for forwarding ties and one for steel, are made in sections of about 34 feet in length. They are connected end to end by hinged joints.

These trams rest on brackets which can be attached to any kind of car, and are placed on a plane below the bed of the car extending along each side of the train, the steel train way on one side and the one for ties on the other.

Each tram is fitted with live rollers operated and driven by a line of shafting running through the entire tramway. The shafting is also made in sections the same length as the tram sections, and joined by angle or universal couplings, which yield to the motion and curvature of the train. Thus, no difficulty is experienced in operating on elevated, depressed or curved track, or during any of the movements of the train in track-laying.

The stationary engine, which is placed on the pioneer or derrick car, drives the two lines of shafting by means of friction clutches, both under the control of one man. The steam is conveyed to the engine through a pipe leading from the locomotive.

The steel rollers and the tie rollers can be started and stopped independently of each other. The movement of the train does not effect their operation. A full supply of material can be sent to the front at all times, whether the train is in motion or not.

The tie tramway projects ahead of the pioneer car about sixty feet so that the tie delivery is out of the way of the steel delivery and the two squads of men can work at the same time without interfering with one another. This point is illustrated clearly in the photograph.

The feed of the ties can be continuous or automatically increased or decreased. The trams can deliver ties at the rate of fifty per minute and can be operated as easily when filled with ties throughout their entire length as when only partly filled.

A Roberts' Track Layer at Work.

The tramway for carrying the ties is equipped with two types of rollers, the live and the idler or dead rollers. The former are of the ratchet type, having corrugations on their surfaces which serve to catch hold of the ties and force them ahead. The dead rollers simply rotate with the motion of the ties. This permits the independent movement of the material without one tie being forced ahead by another.

The steel tramway extends about six feet ahead of the pioneer car so that the ends of the rails are at all times eight to ten feet in front of the car. This provides room to connect easily the meeting ends.

The extended tramway is inclined so that the forward end is low enough to deliver the rails at the most convenient height.

This is a very important and distinct advantage in saving time and strain as the men do not have to reach up to take the rails.

Tramways in other machines are placed down the center of the car or higher than the bed of the cars close to the edge. This means that material must be lifted and loaded in some particular manner, or in specially fitted cars. With the Roberts machine, since the tramways are fitted to the sides of the cars, below the floor, the material can be rolled or dropped in. This is a tremendous saving in labor. Furthermore the tramways may be attached to any kind of car, flat or gondola, regardless of pattern. The brackets on which the tramways rest are inserted from the bottom of the stake pockets.

Any piece of material on any car of the track-laying train can be brought to the front when needed by simply throwing it into the tramway. For example, if hard wood ties are used on curves and soft wood ties on tangents, cars of each material can be placed in the train and the hard or soft wood ties

sent forward on the tram at the time required. Also, if curved rails or short rails are wanted at any particular place they can be thrown into the tram from whatever car they are on and sent to the front as they are needed.

Where small bridges or culverts occur and temporary crossings are put in to carry the train over, extra cars of material for putting in these crossings can be carried on the rear of the train and the material sent to the front by means of the tramways.

All cars carrying steel are placed in front of the locomotive, all tie cars in the rear, with the pioneer or derrick car in front of the entire train.

The rail trams are attached to one side of the cars loaded with steel only, but the tie trams are attached on the opposite side to each car and extend along the entire length of the train.

When the train is made up in this order some of the rear cars can be dropped off until the front cars are unloaded, when the train can back up and bring ahead the loaded cars. In this way a heavy grade can be made with a single engine.

With the locomotive near the front the signals can be given more readily. With the locomotive in the rear when working in a cut on a sharp curve the signals cannot be given directly.

Furthermore, the engineer has better control of the train with the locomotive near the front, and can move more rapidly because of the small amount of slack in the few cars in front of him. With the locomotive in the rear the pioneer car will frequently run off the ends of the rails owing to the amount of slack in the train, and cause great delay at times.

The engineer is signalled by means of a small whistle attached to the stationary engine on the pioneer car.

A force of nine men only is required under ordinary conditions, to run the machine and keep the material moving to the front. Six men are needed in the rear of the locomotive to throw ties into the tramway; two men in front of the locomotive on the opposite side to place steel into the rail tramway, and one man to operate the stationary engine on the pioneer car. A long train is operated as cheaply and as easily as a train of four or five cars. Adding to the length of the train does not necessitate an increased number of men as the material is all forwarded to the front by steam and the same number of men place the material in the trams whether the train is long or short.

The machine can be used on a train of any length and the trams may be connected only to the cars loaded with the material to be used.

The machine has a capacity of forwarding enough ties to lay five to six miles of track a day. It is consequently possible to full-tie ahead. Thereby saving the entire cost of back-tieing. This saving alone is said to be enough to pay the royalty on the machine. The track layer is manufactured by Roberts Bros. No. 17 LaSalle Street, Chicago.

Changes in the Sales Department of the Taylor-Wharton Iron & Steel Co.

Mr. H. A. Johann, and Mr. Martin O'Shaughnessy, who have been in charge of the Taylor-Wharton Iron & Steel Company, Chicago Office, looking after the manganese steel business over the central and southern states, have resigned and will leave the Chicago Office March 31st.

Mr. Johann has been connected with the Company, which was formerly the Taylor Iron & Steel Co., since 1897, and has been recently the oldest man on their staff and was among those engaged in the earliest exploitation work in manganese steel which, for many years, was produced in America by no other company.

Mr. Johann was in charge of manganese steel work everywhere south and west of Pennsylvania, throughout the Mississippi Valley, and the Lake Superior Iron and Copper Companies, all of whom will probably regret to hear of his leaving the business.

Mr. O'Shaughnessy has been connected with the Company for the last two years, and has a host of friends among the trade who will be sorry to hear he is to go into other business.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review in this column such books and catalogs as are sent to us. Books reviewed in these columns will be supplied by The Excavating Engineer Publishing Company at the prices named.

Contractors Machinery and Supply Co., Pittsburgh, Pa.—Booklet 3¼ x 5¾ 32 pages and cover listing a large quantity of second-hand machinery which this company is prepared to supply for contractors' service. Sent free upon request.

Macomber and Whyte Rope Co.—Catalog 7x10, 72 pages illustrating and describing a great variety of wire rope and wire rope fittings manufactured by this company, with special reference made to the Monarch and "Kilindo" rope. One interesting feature of the latter rope is of the fact it is non-rotating. The name "Kilindo" being derived from its tendency not to spin. This feature makes the "Kilindo" brand of rope very valuable for any class of service.

We are also in receipt of a small brochure 5"x7¾" describing the Macomber Whyte steel hoisting rope, which is a special brand manufactured by them.

The Penberthy Injector Company are sending out an 80 page book, and every Superintendent and Engineer at all interested in engine and boiler room practice should have a copy.

It is complete with illustrations of injectors, ejectors, regrinding valves, safeguard water gauges, etc. It thoroughly describes them, gives many facts to be considered in the selecting and handling of injectors, methods of connecting, information regarding repairs, tables of capacities, and really gives a great deal of information that will come in handy to any engineer; and the Penberthy Injector Company of Detroit, Mich., offer to send it free of charge to those who care to write for it, mentioning Department "M".

Railway Equipment Co., Portland, Oregon has issued a 20" x 28" wall calendar which they will be pleased to send to persons desiring it. It will be sent promptly by mentioning The Excavating Engineer.

Alabama

Hartselle—Geo. Hampton, who for three years has been running a Bucyrus shovel for C. G. Kershaw Contracting Company, is now superintendent on their job here.

Harry Michaels is craning a 70 ton Bucyrus on the same job.

Montgomery—Oscar J. Pruett, Montgomery, Ala., has been awarded the contract for constructing 12 miles of railroad from Electric to Vincent, in Elmore County. The work is to be completed in 5 months.

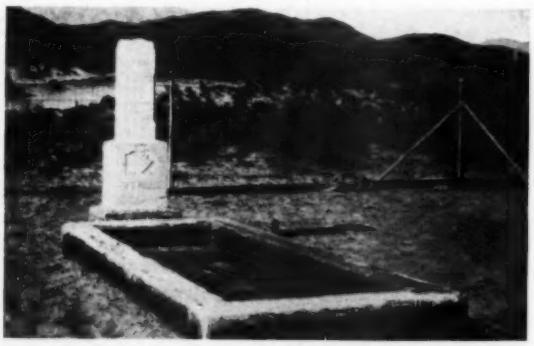
Arizona

Miami—Two Bucyrus steam shovels are employed in the Inspiration Copper Co's mine. McArthur Bros. Co., have the contract and Mr. R. McClure is superintending the job.

Arkansas

Merrilton—Charles E. Dunn is craning a 65 ton Bucyrus Shovel for the Missouri Pacific Railroad.

California



Lone Pine—This illustration shows the last resting place of W. S. Edwards, a well known shovel man, who died here recently. He was buried by his associates on the Aqueduct. It speaks well for the boys, and their good work is of a lasting nature. The head-stone is appropriately carved showing a steam shovel dipper, a tribute to his memory.

Canada

Winnipeg—We are advised by Mr. A. J. MacKinnon that an old steam shovel runner, Mr. Chas. Cummings, died while on a visit to Quebec City on January 26th. Mr. Cummings has been operating shovels for 25 years, the last 10 years having been continuously in the vicinity of Winnipeg working for the Canadian Pacific Railroad.

He was well known among all the shovel men of Western Canada and leaves a wife and three children, to whom we extend our sincerest sympathy.

Notes from Montreal

Bill Scott is running a 14-B Bucyrus for O'Conner Brothers at Meductic, N. B.

Tom Clark, Jack Lascelles and John Ryan are running 70-C Bucyrus Shovels for the Cedar Rapids Power & Manufacturing Company, at Cedars, Que.

William J. Hart is organizing a Brotherhood of Steam Shovel and Dredge Men of Canada. He is being assisted by Tom Clark President of Cornwall Local.

The contracts for the double tracking of the Canadian Pacific Railroad from Sudbury west, have been awarded to the Dominion Construction Co., Toronto; The Cook Construction Co., Sudbury; Chambers, McQuilge, McCaffrey & Cochrane, Toronto; Jones & Girouard, Ottawa. This takes up about 170 miles.

There are about 400 miles more to be allotted, but this may not be done this season.

Lincoln, N. B.—F. C. Huss is craning a 70 ton Bucyrus shovel for John H. Corbett and Sons at this point.

Vancouver, B. C.—Construction work has been commenced on the Lulu Island branch of the Canadian Northern Ry., at Mile 6 below New Westminster, B. C., and about a mile farther west, there will be a trestle two miles long, crossing a muskeg. It is anticipated that this line will be completed about the end of May. The Northern Construction Company are the general contractors. About 89 per cent. of the grading between Port Mann and Kamloops, B. C., has been completed, and about 39 per cent. between Kamloops and Albreda Summit on the divide between the Upper Fraser and North Thompson rivers. The tunnel work between New Westminster and Kamloops is about 93 per cent. completed. Up to the present time, about 15,250,000 cu. yds. of material have been handled on the main line between New Westminster and Kamloops. T. H. White, Vancouver, is chief engineer in British Columbia.

Illinois

Chicago—Mr. Harry Clapp, of Clapp Norstrom and Riley has finally broken his long industrious habit of work and has taken a well earned six weeks vacation at West Baden, Indiana. He returned in splendid health.

Mr. Clapp has not had a vacation for years, and not only his office force, but his many friends are very much pleased that he has decided to have this rest.

Dundee—Our friend Mr. H. A. Krueger is at present located here as the work he has been engaged on is finished. He is open for another job operating either standard type or revolving shovels

Chicago Notes

Mr. E. T. Lewis and Mr. Dyar of the E. T. Lewis Co., Nashville, Tenn., were visitors in Chicago during the Clay Products Show. In addition to their brick manufacturing business this Company does a great deal of sewer work. Mr. Lewis reports that he has had a very successful season with their Little Giant sewer shovel in Nashville. He says the machine has given excellent satisfaction. The sewer is 16 ft. deep by 12 ft. wide, material rock.

The Warren Coal Co., Terre Haute, Ind., has secured control of extensive coal lands south of Terre Haute and has purchased a 150-B Bucyrus coal stripping shovel for uncovering the coal. Mr. J. W. Ijams, Asso. Mem. Am. Soc. Civil Engineers, is Secretary and General Manager of the new Company.

Mr. Chas. Farr, Mr. M. H. Leatherman and Mr. Aubble of the Wadsworth Brick and Tile Co., Wadsworth, Ohio, were Chicago visitors during the week of the Brick Makers Convention. They also visited the works of the Bucyrus Co., South Milwaukee, and purchased an 18-B revolving shovel for their brick plant.

Atlantic Type Shovel Loading Gravel for the Illinois Central R. R. Co., at Forreston, Ill. A. C. Upper, Engineer, H. F. Jentz, Cranesman, F. E. Fitzpatrick, Fireman.

Indiana

Brownstown—Mr. Walter A. Sutton is working for F. C. Morgan on a Fairbanks dredge near here.

Iowa

Delmar Junction—The Walsh Construction Co. of Davenport, Ia., secured the Milwaukee work at Delmar Junction, Ia. Chas. Bessenecker will be in charge.

Murray & Corrigan, Kansas City have a sub-contract.

Castello Bros. are moving two shovels from their Wabash work at Aspinwall, Ia. which they have just completed.

Class 80, Atlantic Type Shovel, Lehigh Portland Cement Co., Mason City, Loading Rock. T. H. Wallace, Engineer and M. H. Nelson, Fireman.

Notes from Pittsburg, Kans.

By W. S. Russell

The usual spring dullness in the coal trade is in evidence and prices are somewhat lower in consequence, several of the underground mines have shut down and more will follow. There is no let up in stripping operations however, which is owing to the fact that strip coal can be produced so much cheaper than shaft mine coal, is graded better, cleaner and turns out less dirt and slack to the ton. Another advantage to the coal stripper is that there is no waste, he gets all the coal whereas in an underground mine from 20 to 30 per cent of the coal must be left in pillars to support the ground overhead from caving in and is lost forever. This of course cannot be avoided and if lumber was not so expensive the mines might be timbered to support the roof and the coal saved, provided the price of coal was high enough to justify the expense—which however is not the case.

A new coal company has just been formed by several prominent business men of Pittsburgh to go into coal stripping, it will be known as the—Moka Coal Company—the incorporators are T. W. Caffey, Geo. W. Williams, Wm. Williams, A. O. Blair, O. T. Jones and Lee Bigley. They have leased 165 acres strip coal land near Mulberry and will install an up-to-date plant consisting of a 150 ton Bucyrus steam shovel a double lift tipple, shaker screens, hoisting engines, tram cars, tram track, locomotive water tank, pumps, piping and everything complete for a first class plant. This is one of the best coal stripping propositions in the district, the overburden is of a moderate depth, the ground is level the coal is of the best quality and two railroads, the Frisco and Kansas City Southern, cross one end of the field which afford unequalled shipping facilities.

Mr. Lee Bigley a well known steam shovel operator will have charge of the mining and Mr. O. T. Jones an experienced coal man will attend to selling the coal. The company will be ready to ship coal by the first of July.

There are two other parties negotiating for strip coal propositions, but we are not at liberty to disclose their names at present.

The Sternberg Coal Mining Co., have a fine piece of strip coal land of 400 acres at Minden, Mo. just over the state line, which they expect to open up next summer with an up-to-date steam shovel plant. Their sales office is 816 Reserve Bank Building, Kansas City, Mo.

Of the 20 coal stripping steam shovels now located in this field, all are working excepting one at Scammon owned by the J. R. Crowe Coal Co., which shows a prosperous condition in the coal stripping operations.

The Ellsworth-Klaner Co. have sold their 70 ton Bucyrus shovel to the Columbia Quarry Company of St. Louis Mo. for service in their rock quarry at Columbia Ill.

Mr. J. H. Blair a contracting engineer formerly of this city accompanied by a party of eastern coal operators were guests at the Stilwell Hotel the latter part of February, they have organized the Ohio Valley Coal Co. and have purchased 450 acres of strip coal land near Booneville, Indiana, 18 miles east of Evansville, in the southern part of the state. The overburden averages 21 feet in depth the coal 6 feet thick, this is an ideal coal stripping proposition. The company will install 3 of the largest type of revolving steam shovels for stripping the coal and 2 of the smaller size for loading the coal, it is proposed to operate the entire plant by electric power but this feature is not definitely decided on at present. The object of their visit here, was to look over coal stripping operations. They visited the Smith, Scott & White coal stripping where they were entertained by Mr. E. P. White and saw the three big 185 ton Bucyrus steam shovels working, one of them was digging in a soft sand rock without blasting which was a revelation to them. The party also took a look at the Ellsworth-Klaner Company's big Marion

shovels operating near by and examined their method of loading the coal. They left fully satisfied that strip coal mining with steam shovels was a complete success.

The Clemens & Son Coal Co's 150 ton Bucyrus steam shovel recently installed at North Pittsburgh is in full operation having uncovered about 300 feet of first class coal in length of pit. The tipple and tram tracks are completed and will commence loading coal in a few days Supt. Cunningham is in charge,

J. J. Stephenson has returned from a two months trip to Panama, Cuba and Texas, greatly benefitted in health, he reports a very pleasant time all the way through.

J. G. Ralston and R. H. Rossitter of the Marion Steam Shovel Company were at the Stilwell Hotel last week. Mr. Ralston goes to Atlanta, Ga. to open an office and Mr. Rossitter will have charge of the office at Chicago.

Mr. W. S. Oakford of Peoria, Ill. was a guest at the Stilwell Hotel for several days. His firm may decide to go into coal stripping in a short time.

The Pittsburg Machinery Co. are a new firm recently organized to sell mining machinery of all kinds, both new and second hand. The principal members of the firm are George Dean and John Frain, both well known residents of Pittsburg and practical men in this line of business. They have fitted up an office and spacious store room in the Stilwell Hotel which is headquarters for coal mining people and contractors, and having an extensive acquaintance are well prepared to do an extensive business. Parties requiring coal mining or other machinery will do well to call on them.

Kentucky

Paris—Glen H. Thomson, who was formerly with the Flick Construction Company of Chicago, Illinois, and Deavonshire & Maxfield of Miamisburg, Ohio, is operating a shovel for Hough & Spradlin Co., at Camp 2.

Praise, Pike County—Mr. J. S. Secrett is running a 70-C Bucyrus shovel for Reinhart & Dennis Co., at this place.

Louisiana

New Orleans—The Southern Pacific, it is reported, will construct an extension from Port Barre to Moreauville and Marksville, La., about 40 miles. E. B. Cushing is engineer of construction, Houston, Texas.

Massachusetts

West Newton—Frank Hanusch is operating a Bucyrus steam shovel near here.

Blandford—M. E. Sutton is running a 70-C shovel night shift for James H. Wright Company, at this point.

Webster—A. C. Carroll, who has been operating a 70-C Bucyrus on the Grand Trunk work near this city, is open for a position as this machine has been laid off for the winter. His experience covers 15 years on various classes of excavating machinery.

Michigan

Niles—J. F. Norton of Waterloo Indiana has effected a consolidation of interests with Dodd Bros. and the new firm of Norton & Dodd Bros. will enter the general contracting business with headquarters in this city. They are equipped to do all kinds of dredging and ditching and have recently closed one contract amounting to about $15.000.

Minnesota

Nashwauk—It is expected that stripping operations at the Hawkins mine, at Nashwuak, on the Mesabi range will be resumed shortly. This is one of the large properties in Minnesota and is operated by the International Harvester Co. through its subsidiary, the Wisconsin Steel Co. Stripping will also soon be resumed at the Bennett mine, near Nashwauk. Both the Hawkins and Bennett will ship heavily during the coming year.

Notes from Duluth.

The Inland Steel Company have been asking bids on an 800,000 yd. contract for stripping the Thompson Mine at Crosby, Minn., on the Cuyuna Range. The president, Mr. P. E. Block, of Chicago, was a recent Duluth visitor, and will likely hear who the successful bidder is in a very short time.

The George Crosby Exploration Co. are also asking bids on some stripping work on the Cuyuna Range.

The Minneapolis, St. Paul, Sault St. Marie Ry., are contemplating considerable work to connect their lines with the several mines on the Cuyuna Range.

The Pennington Mining Company are making the dirt fly at their open pit mine west of Crosby with two Bucyrus 85-C. shovels, 16-yd. Western cars, and 20x24 Baldwin locomotives.

The Interstate Iron Mining Company will soon start to strip and work the Columbia Mine, an open pit proposition, which is within the city limits of Virginia, Minn. The opening of this mine will neccessitate the moving of a number of houses, and the closing of some of the streets and avenues of the city. The ore deposit is said to be large and it will take several years to remove all the mineral. Supt. Judd of Duluth, of the Interstate Iron Co., is now visiting Virginia frequently preparatory to cleaning the surface and getting ready for the stripping of the ore.

The Oliver Iron Mining Company have announced that they will begin preparing their open pit mines for active operations on April 1st, and expects to start loading ore April 15th.

The labor situation in this region does not look as bright as it might, but the wage scale as announced for the coming year should aid greatly in obtaining the number of men required. The Range towns should particularly attract a married man with children as the schooling facilities on the Range are of the best, and the work is steady for when the men are not working in the open pits there is plenty of work in the woods, underground, in the mills and shops. The Range people are looking forward to one of the best seasons they have ever had, and it is predicted that the ore tonnage sent from the Lake Superior district this coming year to the lower lake ports will be 50,000,000-tons or greater.

A great deal has been said about making the dirt fly on the Panama Canal, but few people know that there is more work accomplished every year in the excavating line on the Mesaba Range than has been done in any one year on the Panama Canal, and unless a person has visited the Mesaba Range they cannot conceive of the extent of the work being carried on there.

The Bates & Rogers Company, the successful bidders for the new Mesaba Ore Dock, are making rapid progress in their work.

Siems-Carey Company, contractors for the Northern Pacific Ore Dock at Superior, Wis., certainly have made a big showing since they commenced work a month or two ago.

Missouri

Kansas City Notes

By M. T. Babb

Considerable interest has been manifested by contractors in this vicinity over the C. B. & Q. work in Wyoming, Twoby Brothers, general contractors. Several outfits are contemplating moving there for the summer.

L. I. Viall, General Superintendent for Wood, Bancroft & Doty, was in the city for a few days recently, but the fine weather of early spring took him right back to his C. M. & St. P. work at Woodward, Iowa. Mr. Viall states his firm will soon be in the

market for a contract. They have a splendid 4 yard car plant complete in every respect.

Lee Sigler has just received his new Western grader and wagons and will soon be moving dirt at the Quindaro Water Works in Kansas.

W. T. Murray spent a couple of days with his family last week. Mr. Murray reports good progress on his work considering the season of the year. He is now located at Elwood, Iowa, on the Milwaukee.

W. M. Spencer was a caller at our office last week. Mr. and Mrs. Spencer are making their permanent home at Excelsior Springs, Mo. Mr. Spencer's 4 yard plant is now idle and he is in the market for work. A letter will reach him at the above address.

Cameron, McManus & Joyce, Keokuk, Iowa, have secured a yard contract on the A. T. & S. F. R. R. near Shopton, Iowa, and the same firm were successful bidders for team work on A. C. & N. W. Coal Road near Lovilia, Iowa. Both contracts to start immediately.

There is considerable activity among city contractors here this spring as a large amount of city work is contemplated for the summer. Some good size contracts have already been awarded and many more to come up soon.

As spring comes on the feeling seems to grow that this is to be a good contractors year. A month ago some doubt was expressed as to this but later developments have dispelled all feeling of doubt. We hear a number of people express their opinion on this point during a month, and from the talk of the past four weeks, we cannot but think the summer of 1913 will be one of profit to our friends, the railroad contractors.

St. Louis Items

By A. J. Michel

The Pieper Contracting Co. have a 4 or 5 team outfit that they wish to place on some work close to St. Louis. Address them 3432 Louisiana Ave. St., Louis, Mo.

Columbus S. Jones more popularly known as "11c. Jones" will have a lot of station work for the old humpers this season. He has contracts on the Michigan Central and the Milwaukee lines that will keep him busy all season. He is covering several miles of work on the Wabash in Illinois with team outfits and expects to get going full blast by April 5th.

Anyone wishing to work a few teams by the day or contract write him care Michel Labor Agency, St. Louis.

Wm. Bell the well known team foreman has taken charge of Ed. Petersen's outfit on the Canadian Pacific at Moosehead Canada. Bell will have charge of the entire outfit of over 100 teams.

Mulville Bros. of Alton, Ill. have 4000 feet of work to let on the C. & A. R. R. at Roodhouse, Ill. Free transportation for outfits both ways. They have also some very fine roadwork to let at Fulton, Mo. This is county roads improvement and betterment work.

In addition to the above Mr. Mulville expects some choicy team work by the time of this issue. Write them Alton, Ill.

A. J. Michel, Labor Agent in St. Louis is correspondent for the Excavating Engineer. If you have any news of interest send it to him for publication.

J. V. Crawford the well known shovel runner is here. Idle at present. Any one needing his services may wire care of Michel Labor Agency.

H. S. Dickey has secured a nice slice of Wabash shovel work on the Danville division. This is not heavy work and will be done with a Thew shovel.

Wm. Beauheld will operate the "Whistle" on this job.

W. J. Donnelly, Superintendent for the Roberts & Schaefer Co. of Chicago gave us a call recently. He is busy looking after his various coal chute contracts in Illinois.

Geo. Vaughan of Waterloo, Ill. has a grader for sale. Address him there.

Lou McClelland moved his outfit to Bement, Ill. this week. He has 10 teams on this work for the W. E. Tench Const. Co.

Contractors needing steam shovel laborers or labor of any kind write or telegraph the Michel Labor Agency, 9 S. 9th St. St. Louis.

John Scott & Sons will resume work at Bloomington, Ind., on the Illinois Central contract next week. This is heavy rock work and part of an unfinished contract of last fall.

New York

Albion—Tom Poole is running a Class 14 Bucyrus dragline for Cooper & Company here. Until recently he was with The Southern Dredging Co., at Baton Rouge, La., on a Class 24 Bucyrus, but neither he or his wife could stand the climate so they came north again.

Hornell—Friends of F. A. Crabb will be glad to hear that he has practically recovered from the very severe accident that he suffered last summer.

Mr. Crabb was repairing a broken U-bolt on an Erie Railroad shovel at Barton, New York, when he got his arm caught on one of the thrusting gears of the boom, breaking the arm in several places and bruising him severely. He is now giving his Bucyrus shovel a thorough overhauling in the Erie Railroad shops at this point.

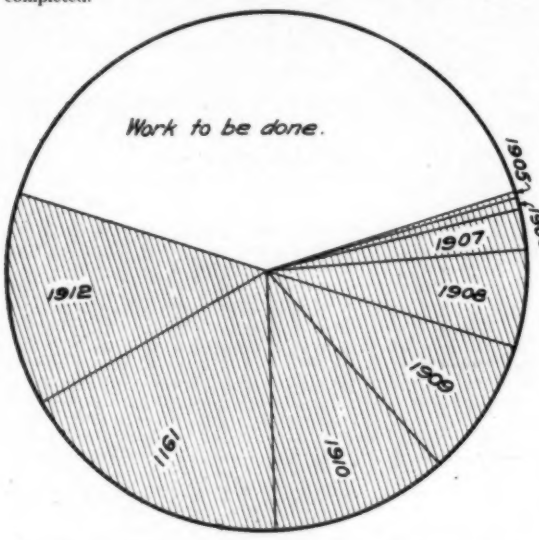
Mechanicsville—Bernard Nolan is operating one of the five Bucyrus steam shovels employed on the work now being done on the new hump yard.

Newark—The following men are engaged on the Barge Canal contract of J. A. Gillespie & Co., of Newark, New York. 70-C. Bucyrus shovel engineers: D. Overdorf, W. B. Shaw, Chas. Dugan, Wm Boothby, J. S. Watters, and T. Dugan. Cranesmen: B. J. Rohr, J. D. Henderson, E. B. Nebb, I. McMinnamon Jr., M. Moran and J. McDonald. Marion 60 shovel engineers: H. C. Miller, L. Morris, W. Wiser, G. Rivers and H. J. Camp. Cranesmen: J. Brady, C. B. Rohr, D. Foley, L. F. Emery and W. H. Ritchie. M. J. Coffey is superintendent, and H. Kuhn is master mechanic. The machines upon which they are operating are all double crewed working eight hours.

T. A. Gillespie's 70-C Bucyrus Digging Rock near Newark, N. Y., on the Barge Canal.

Steamburg—Arthur Hammond is craning a Bucyrus shovel for the Miller Construction Company here.

Albany—We give below a diagram showing the progress of work on the barge canal to Jan 1st, 1913. The circle represents the total construction cost, and the shaded portion the work completed.



Albany—General Manager R. H. Smith of the Albany Southern Railway announces that actual work upon the line will be started in the spring. Civil engineers and surveyors are in the field locating the route from Pittsfield, Mass., to Alabany. The proposed line will pass through Brainard, New London, Lebanon Springs and West Lebanon, N. Y.

Steamburg—Gus. Elstrom is firing a Bucyrus shovel for The Miller Construction Company at this place.

New York Notes

By S. J. Atwood

Winston & Company are opening their work at Brown's Station, N. Y., on both the dam and railroad, as the open winter has made it possible to start work earlier than at any previous season since this work began, four years ago, also the first shipments of laborers were carried to the work, on the first boat to go up the river for spring business, all of which speaks for a busy spring in this locality.

McArthur Brothers Pile and Foundation Company are starting a large piece of work at Branford, Conn., in the way of concrete foundation for the new works being built by the Malleable Iron Fittings Company.

Mr. J. C. Zobrist was in New York for a few days getting laborers and machinery for his work at Elkhorn City, Ky., he is just moving in a new steam shovel on this work and expects from now on to move dirt rapidly.

We have just received a call from Mr. W. I. Steele of Mart, West Virginia, he tells us that the water has subsided, and general conditions are looking for a most prosperous and an early season, which makes the contractors in that part of the country smile and look happy.

The Keystone Contracting Company have about finished their work on the Erie at Concord, Pa., and will move their outfit to a new contract near Pittsburgh, Pa., where they have secured work which keep them busy for a long time to come.

Rinehart & Dennis Company have just been awarded a contract on the Norfolk and Western Ry. for double tracking, work to begin near Petersburg, Va. This work covers excavation, masonry, concrete and etc.

The work on an electric line with headquarters at Chester, Mass. is being pushed with all possible speed, and has not been closed down at all this winter, John B. Carter, of New York City, Jas. W. Wright Company and the C. A. Deneen Company are doing this work and expect to come out on time with a good profit.

The Alabama Power Company of Birmingham, Ala., have increased their rolling stock on their railroad between Ocampo and Lock Twelve on the Warrior River, with two locomotives and expect soon to add two more locomotives and are making many improvements along the line.

The labor situation in New York City has improved materially in the last few weeks, many foreigners returning to this country as spring work is expected to open up, and many coming in from the southern work, which is closing down. An early order for almost any nationality can be promptly and satisfactorily filled.

North Carolina

Wilmington—The Atlantic Coast Line R. R., it is reported, will soon award contracts for double-track work from Selma to Parkton, N. C., about 60 miles. The line from Parkton to Sumter S. C., will be improved by laying 85-lb. rails. E. B. Pleasants, Wilmington, N. C., is Chief Engineer.

Henderson—Virginia & Eastern Carolina R. R., will award contracts in about two months for the construction of its line from Henderson, N. C., to Wilson or Rocky Mount, N. C. J. C. Cruikshank, Henderson, N. C., is Chief Engineer.

New Hill—W. D. Barber is craning an Atlantic steam shovel for Lane Bros. Co., on the Norfolk and Southern R. R. at this place.

Ohio

Youngstown—The Caldwell Construction Co., Youngstown, has a contract for building the Lake Erie & Youngstown railroad between Youngstown and Conneaut. This contract includes 1,400,000 cubic yards of excavation, five bridges requiring 4,600 tons of steel, a large amount of concrete masonery, a machine shop and equipment, two round houses, station buildings, etc. The grading, concrete and steel work probably will be sublet.

Oklahoma

Oklahoma City—Improvement rather than extension is to be the policy of the Santa Fe during 1913. President Ripley made this announcement on his return from an inspection tour of the Santa Fe's gulf lines. The lines west of Albuquerque will be double tracked, the intention of the company being to eventually have a two track railroad from Chicago to the Pacific Coast.

Panama

The high record for the month of January was made by shovel 227, a Bucyrus 95 ton, working 26 days in the Empire District, which excavated 45,541 cubic yards of rock. The second best record for the month was made by shovel 208 a Bucyrus 95 ton, working 26 days in the Culebra District, which excavated 44,481 cubic yards of rock.

The best record for a shovel of the 70-ton class was made by shovel 109 a Bucyrus 70 ton working 25½ days in the Culebra District, which excavated 28,056 cubic yards of earth.

The development of slides in Culebra Cut has resulted in an addition of 5,634,161 cubic yards to the total estimated excavation on that part of the work, so that the estimate now stands at 99,516,817 cubic yards. In the estimates of December, 1908, the excavation in Culebra Cut was placed at 78,042,295 cubic yards, in 1910 this was changed to 84,186,724 cubic yards, 1911 to 89,444,005 cubic yards, 1912 to 93,882,000. The total canal excavation now is estimated at 218,138,299 cubic yards, of which 190,892,279 cubic yards have been accomplished.

Pennsylvania

Pittsburgh—John R. Bender, 615 Ferguson Building, is operating a 70-ton Bucyrus shovel for McMenamin & Sims.

Pittsburgh—The Montour R. R. which is a consolidation of The Montour R. R., The Pittsburg and Moon Run R. R. and the North Star and Miffin R. R., has awarded a contract to John Marsch, 105 S. La Salle St., Chicago, Ill., for building a 35-mile extension from North Star through a coal section in Washington and Allegheny Counties to Miffin Yard south of Homestead. Mr. Marsch will put 4 new 85-C Bucyrus shovels on the job. The company will do the track laying and ballasting with their own forces. The Keystone Contracting Co., Keystone Bldg., Pittsburgh, has the sub-contract for Sections A and B.

Pittsburg—The Keystone Contracting Co., of Pittsburg, Pa., have sub-contract for section "A" and "B" under John Marsch on the Montour Railroad, amounting to 240,000 cubic yards of excavation.

Pittsburg—Thomas Connor & Sons, Greensburg, Pa., have section "H" on the Montour Railroad under John Marsch, which includes 185,000 cubic yards of excavation and a tunnel 640 feet long.

Notes from Girardville
By G. Hughes

A. E. Dick has just started a new 70 ton Bucyrus and two 18 ton locomotives at Reliance stripping, Mt. Carmel, which will be one of the largest coal strippings in this region. Mr. Dick has five Bucyrus shovels in operation at this time.

The Philadelphia & Reading Coal & Iron Co., have a 40-R Bucyrus at their coal stripping at Reliance, Mt. Carmel, loading coal. Chas. Klinger engineer, Chatton Smith, cranesman.

Lehigh Valley Coal Company have a Bucyrus 18-B shovel at their coal stripping at No. 2 Lost Creek. John Griffin is at the levers and Tom Casman is fireman.

Tennessee

Bucyrus 70C Shovel, Owned by the Pennsylvania Contracting Co., moving about 1200 cubic yards daily at Franklin, Tenn. Valentine Mauney, Engineer, Geo. Conway, Cranesman. L. E. Rice, Fireman.

Virginia

Monroe—Curtis and Shumway, Inc., Slatington, Pa., have secured a contract for 7 miles of double track on the Southern Railway between Amherst and Monroe, Va., and will sublet about 2,000 yds. concrete and 50,000 yds. team work, balance of work to be done by steam shovels. C. M. Rogers is secretary and treasurer of company.

Washington

Spokane—The Oregon Washington Railroad & Navigation Co. will build new track as follows: Ninetween miles between Ayer Junction and Spokane (Wash.); 5 miles second track between The Dalles & Crates (Oregon); 1.12 miles from South Montesano to Montesano (Washington).

Olympia—The Northern Pacific Ry., according to maps filed at Olympia, is planning a considerable amount of construction work in Washington for this year. This work will probably include the Ritzville-Ellensburg cut-off, 100 miles; the extension from Kelso on the Columbia river through Brookfield, Oneida and Nema to Willapa harbor and north to Grays Harbor, the extension of the Sunnyside branch from Grandview to a connection with the main line at Gibbon.

Weston—The Northern Pacific will build cut-off at Weston this summer and will double track 10 miles on the Cascade line leading to the tunnel.

Sunnyside—The Northern Pacific Co. is about to let contract for grading of a 12-mile extension of the Sunnyside branch from Gibbon, on the main line, northwest to Grandview. Grading and building bridges will cost about $120,000, the company to lay the steel.

A. R. Cook of Tacoma is Engineer.

Wisconsin

Black River Falls—Alex McGavock has a contract to refill that portion of the city that was washed away by flood about two years ago. He is working his 70-C on the job. Mr. McGavoc has recently finished some work for the C. B. & Q. at La Crescent, Minn.

Wyoming

Powder River—Twohy Bros., Portland, Ore., general contractors for the Powder River-Orin Junction line of the C., B. & Q. R. R., have let sub-contracts as follows: Gilbert Bros., Denver, Colo., 24 miles; Baker Bros, Denver, Colo., 10 miles; J. Coates, Las Animas, Colo., 6 miles; J. Fred Roberts, Denver, Colo., 10 miles.; C. R. Conover, Denver, Colo., 6 miles; P. J. King, Denver, Colo., 6 miles.

Pat and Mike were crossing the Delaware River on a ferryboat. They were watching intently a big dredging barge that was sending its mammoth scoops under the water and bringing up tons of mud.

"Pat," says Mike, "wouldn't yez loike to be a-workin' over there on thot mud-digger?"

"Yis," says Pat, "but begorra, Oi'd hate to be one of the fellows under the water that's fillin' up thim shovels."

A Wasted Example.—An old lady leaving church after a service which had been attended by a crowded congregation, was heard to say: "If everybody else would only do as I do, and stay quietly in their seats till every one else has gone out, there would not be such a crush at the doors!"—*Milwaukee Sentinal.*

Disconcerting.—"What does this nation need?" shouted the impassioned orator. "What does this nation require, if she steps proudly across the Pacific, if she strides boldly across the mighty ocean in her march of trade and freedom? I repeat, what does she need?"

"Rubber boots," suggested the grossly materialistic person in a rear seat.—*Exchange.*

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1—No. 0 Thew Traction—2 yrs. old. Fine condition.
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1—No. 1 Vulcan Standard Gauge. Boom fitted to handle bucket as well as dipper. Used three months.
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1—Marion 40. Fine condition. With 1½ yd. dipper.
1—Marion 60. Good as new. With 2½ yd. dipper.
1—Marion 75. 1 yr. old. With 2 yd. dipper.
1—Marion 95 ton. Rebuilt and in perfect condition. With a 3½ yd. dipper.
1—70 ton Bucyrus. Splendid condition. With 2½ yd. dipper.
1—70-C Bucyrus. Good as new. With 2½ yd. dipper.
1—95 ton Bucyrus. Splendid machine. 3½ yd. dipper.
And a great many others. Write for our bulletin.

LOCOMOTIVE CRANES

1—10 ton McMyler with 38′ boom.
1—10 ton Industrial with 38′ boom.
1—15 ton Interstate with 50′ boom.
1—20 ton Interstate with 50′ boom.
All of the above are equipped for handling two line buckets.

LOCOMOTIVES

9 x 14 Porters & Davenports good condition.
10 x 16 Porters & Davenports fine condition.
1—4 wheel 45 ton Interstate fine condition.
1—25 ton Porter Saddle Tank Standard gauge.

DRAG LINES

2—100′ boom Heyworth-Newman fine condition.
1—60′ boom Class B Lidgerwood-Crawford good shape.
1—60′ boom Monighan and some smaller ones.

MISCELLANEOUS

Gyratory & Jaw Cruchers. Hoisting Engines. Cableways. Clam and Orange Peel Buckets. Pile Drivers. Mixers. Cars, Air Compressors, Drills. Trench Machines. Pumps. Graders and everything used by contractors.

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J. I. Case 20 H. P. Comp. Traction Engine—Used 4 months

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MACHINERY BARGAINS

Three Model G Marion Steam Shovels, 2½ yd. dippers, air brakes and all M. C. B. equipment, $2500.00 each.
170 25-ton Flat, Coke and Coal Cars, standard gauge, M. C. B. equipment, stenciled and painted to order, first class condition, $350.00 each.
420 30-ton Flat, Coke and Coal Cars, standard gauge, air brakes and all M. C. B. equipment, stenciled and painted to order, guaranteed in first class condition, $375.00 each.

The above equipment is located at Pittsburgh, Pa., and is offered you subject to inspection and prior sale.

Contractors' Machinery & Supply Co. Steuben & Carson Sts. Pittsburgh, Pa.

Second-Hand Shovels For Sale

1 Class E 65-Ton Vulcan Shovel.
1 Giant D Special 60-Ton Vulcan Shovel.
1 Giant D 50-Ton Vulcan Shovel.
1 Little Giant High Crane Vulcan Traction Shovel.
1 Model 30 Ohio Steam Shovel, 1 yd. Dipper 38 tons

BUCYRUS COMPANY SOUTH MILWAUKEE, WIS.

...FOR SALE...

One 10-Ton Locomotive Crane

Practically New

BUCYRUS COMPANY, South Milwaukee, Wis.

POSITION WANTED

Wanted—Position as cranesman on steam shovel. 4 years' experience on Bucyrus machines. Sober, industrious and willing to hustle. JOHN W. LEWIS, R. F. D. No. 2, Nashville, Ga.

LOCOMOTIVES,
STEAM SHOVELS, ETC.

FOR CONTRACTORS, MILLS, MINES, FURNACES, AND ALL CLASSES OF INDUSTRIAL SERVICE.

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We handle strictly modern equipment only, rebuilt in the best possible manner, by skilled workmen.

Our monthly stock list shows upward of 150 desirable items; we will gladly mail a copy upon request.

HERE ARE JUST A FEW; WE HAVE MANY OTHERS:

One 20x24 55-ton 10-Wheeler; Standard Gauge; Excellent Locomotive.

One 17x22 Lehigh 6-Wheel Switching Locomotive, Standard Gauge.

Three 12x16 Manhattan Elevated Forney Type Locomotives, Standard Gauge.

One 10x16 Porter 4-Wheel Saddle Tank Locomotive, 36 in. Gauge.

Ten 9x14 Porter 4-Wheel Saddle Tank Locomotives, 36 in. Gauge.

One 12x18 Baldwin 4-Wheel Standard Gauge Saddle Tank with 2-Wheel Back Truck.

Four Marion Model 60 Steam Shovels, 2½-yard Dippers.

Two Little Giant Special Steam Shovels, 1¼-yard Dippers.

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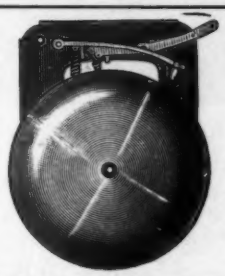

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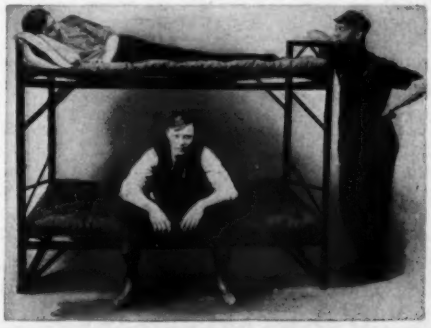

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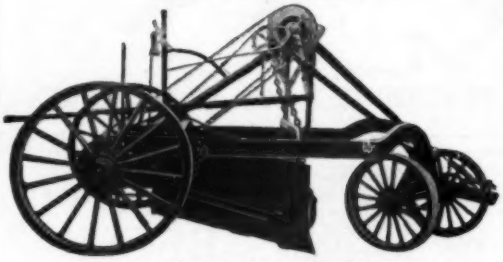

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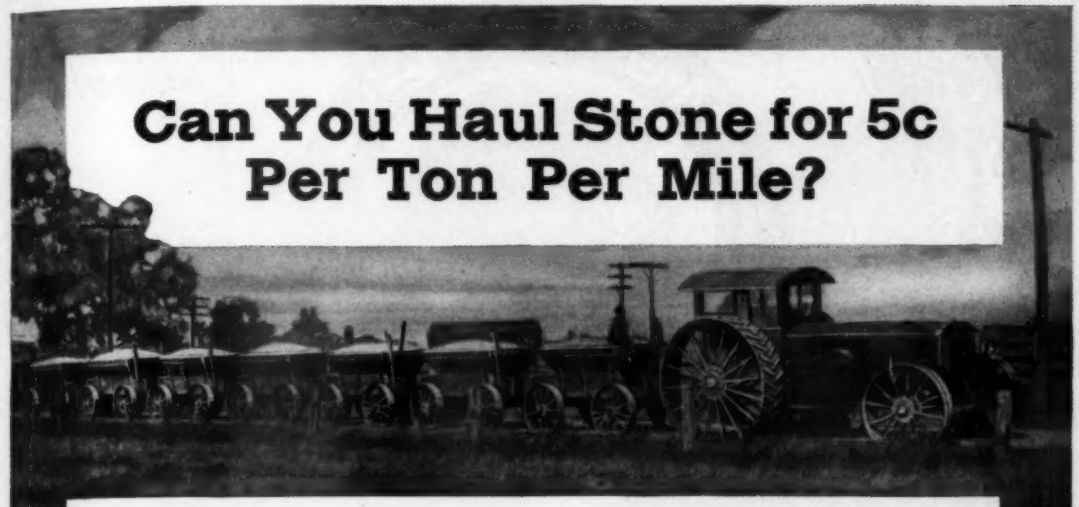

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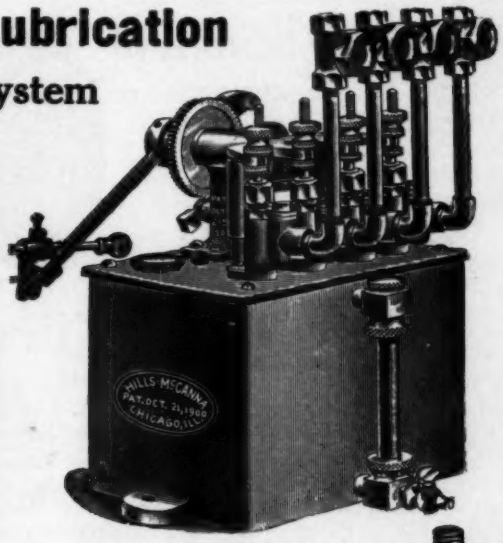

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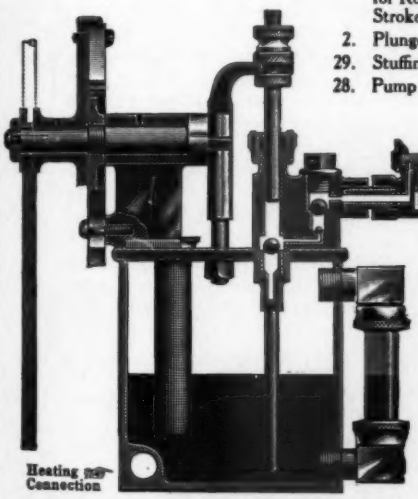
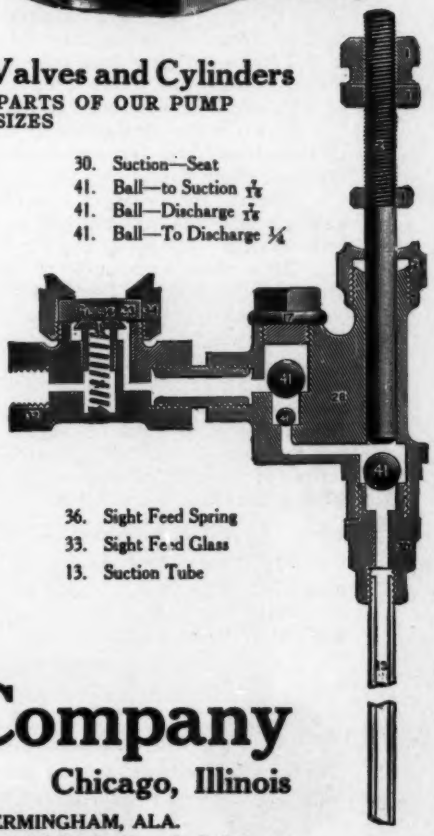
2. Plunger, $\frac{7}{16}$
29. Stuffing Box
28. Pump Valve



17. Pump Valve Cap
32. Sight Feed Body
34. Sight Feed Holder
35. Sight Feed Plunger

30. Suction—Seat
41. Ball—to Suction $\frac{7}{16}$
41. Ball—Discharge $\frac{7}{16}$
41. Ball—To Discharge $\frac{1}{4}$



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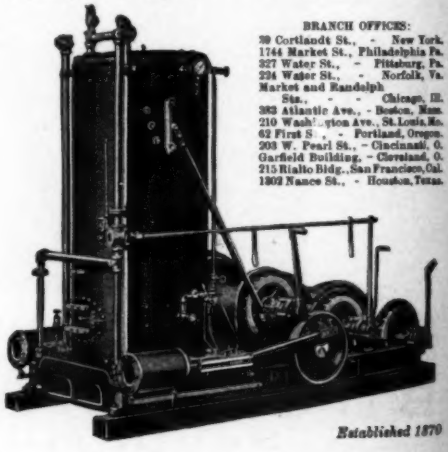

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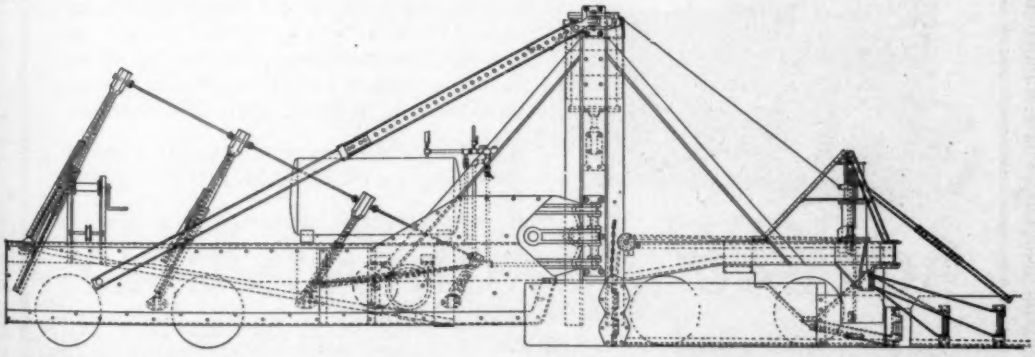

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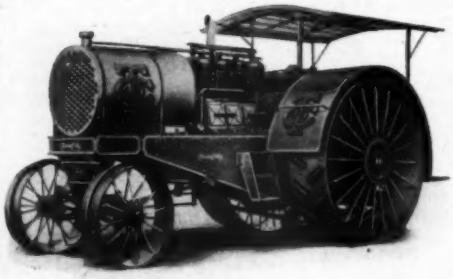

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